

an absorption section for absorbing said reflected wavelengths and generating a photocurrent from said absorbed wavelengths; and

D<sup>1</sup> a tuning section for changing said effective index of said grating so that only a particular wavelength is selected to be reflected by said grating and therefore absorbed by said absorption section.

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5. (Twice amended) A semiconductor photodetector device comprising:

a substrate of a first doping type;

D<sup>2</sup> an undoped region, laterally disposed above the substrate;

a waveguide laterally disposed above the undoped region for passing light therethrough;

a grating with a tunable effective index positioned between the substrate and the undoped region for reflecting one or more wavelengths of said light;

an upper region, of a second doping type, laterally disposed above the waveguide region;

an absorption section positioned above said upper region for absorbing said reflected wavelengths and generating a photocurrent from said absorbed wavelengths;

a tuning section for changing said effective index of said grating so that only a particular wavelength is selected to be reflected and therefore absorbed by said absorption section..

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30. (Deleted) ✓

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31. (Amended) The semiconductor device of claim 1 wherein said tuning section

D<sup>3</sup> comprises an electrode, and said effective index is changed by changing an electrical current injected into said electrode.

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32. (Deleted) ✓

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D4  
33. (Amended) The semiconductor photodetector of claim 5 wherein said tuning section comprises an electrode, and said effective index is changed by changing an electrical current injected into said electrode.

DS  
34. (Added) The semiconductor device of claim 1 wherein said absorption section comprises an electrode for generating said photocurrent from said absorbed wavelengths.

35. (Added) The semiconductor photodetector of claim 5 wherein said absorption section comprises an electrode for generating said photocurrent from said absorbed wavelengths.

### REMARKS

This is responsive to the office action dated September 16, 2002 in which the Examiner rejects all the pending claims 1-13, 16, 18-19 and 29-33 either as being anticipated by Matsui (JP Patent 363111679A) under 35USC §102(b) or as being obvious over Matsui (JP Patent 363111679A), Aoki et al (US Patent 5,737,474), Chandrasekhar (US Patent 5,689,122), Nitta et al (US Patent 6,252,895), Rushing (US Patent 6,331,832) and/or their combinations under 35USC §103(a). The Examiner also rejects claims 30-33 for being indefinite under 35USC §112. The applicants have further amended independent claims 1, 5, 31 and 32 for more clearly defining the present invention, deleted claims 30 and 32, and added two new dependent claims 34 and 35. The applicants believe that the above amendment has overcome the rejections under 35USC §112, and respectively traverse the rejections of the Examiner under 35USC §102(b) and 35USC §103(a) based on the above amendment and the explanations as below.

The present invention teaches a novel semiconductor device (photodetector) for